PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference BW-433-1	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US03/27087	International filing date *(day/month/year)* 28 August 2003 (28.08.2003)	Priority date *(day/month/year)* 09 September 2002 (09.09.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): A24B 015/24 and US Cl.: 131/290,297,298,300,309,310		
Applicant BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 9 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
05 April 2004 (05.04.2004)	01 May 2004 (01.05.2004)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Dionne A. Walls Telephone No. (571) 272-1700

Form PCT/IPEA/409 (cover sheet)(July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/27087

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed.

☒ the description:
pages 1-12 as originally filed
pages 3,4, filed with the demand
pages NONE, filed with the letter of _____.

☒ the claims:
pages NONE, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages 13, filed with the demand
pages NONE, filed with the letter of _____.

☒ the drawings:
pages 1, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☐ the sequence listing part of the description:
pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages NONE

☐ the claims, Nos. NONE

☐ the drawings, sheets/~~fig~~ NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*
*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/27087

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims 1-8	YES
	Claims NONE	NO
Inventive Step (IS)	Claims 1-8	YES
	Claims NONE	NO
Industrial Applicability (IA)	Claims 1-8	YES
	Claims NONE	NO

2. CITATIONS AND EXPLANATIONS

Claims 1-8 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest contacting the tobacco material with a first aqueous solvent for the claimed time under the claimed temperature range.

Claims 1-8 meet the criteria set out in PCT Article 33(4), and thus meet industrial applicability because the subject matter claimed can be made or used in industry.

---------- NEW CITATIONS ----------

containing pyrolitic products emitted from smoking articles which contain the tobacco material.

It is an object of the present invention to provide a tobacco product with reduced levels of lignin and nitrogenous compounds.

It is another object of the present invention to provide a method of making a tobacco product with reduced levels of lignin and nitrogenous compounds.

It is a further object of the present invention to provide a method of treating tobacco which minimizes the break-up of tobacco solid materials.

More particularly, the present invention is directed to a method for reducing the lignin and nitrogenous content of tobacco material, including cured tobacco whole leaf, fines, scraps, stems, and lamina, as well as burley leaf and stem, comprising the steps of: contacting tobacco material with a first aqueous solvent, such as water, at a temperature of about 60°C to 80°C for about 0.5 to 1 hour; separating an aqueous tobacco extract from a tobacco fiber portion; contacting this washed tobacco fiber portion with a solution containing from 1% to 5% (weight/weight) alkali metal hydroxide and from 2.5% to 12% (weight/weight) hydrogen peroxide at a temperature of about 25°C to 120°C for about 0.5 to 4 hours and, separating the resulting solution from the tobacco fiber portion. The resulting tobacco product is then dried and used in the manufacture of cigarette articles. Alternatively, the extract, or a portion thereof, may be added back to the tobacco product before drying.

A better understanding of the present invention will be realized from the hereafter processes and the Examples following such description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic of the process steps representative of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

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More particularly, the present invention is directed to a method for reducing the lignin and nitrogenous content of tobacco material, including cured tobacco whole leaf, fines, scraps, stems, and lamina, as well as burley leaf and stem, comprising the steps of: contacting tobacco material with a first aqueous solvent, such as water, at a temperature of about 60EC to 80EC for about 0.5 to 1 hour; separating an aqueous tobacco extract from a tobacco fiber portion; contacting this washed tobacco fiber portion with a solution containing from 1% to 5% (weight/weight) alkali metal hydroxide and from 2.5% to 12% (weight/weight) hydrogen peroxide at a temperature of about 25EC to 120EC for about 0.5 to 4 hours; and, separating the resulting solution from the tobacco fiber portion. The resulting tobacco product is then dried and used in the manufacture of cigarette articles. Alternatively, the extract, or a portion thereof, may be added back to the tobacco product before drying.

A better understanding of the present invention will be realized from the hereafter processes and the Examples following such description.

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FIG. 1 is a schematic of the process steps representative of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In a preferred method of carrying out the lignin and nitrogen reduction process of the present invention, tobacco materials (10) in the form of flue cured and burley stems, scraps, fines, and/or lamina are contacted with a first aqueous solvent (12), such as water, at a temperature of about 60EC to 80EC for about 0.5 to 1 hour. The contacting of the tobacco with the water (12) may be conducted in a tank or similar mixing vessel in which the water and tobacco are heated and agitated. The resulting aqueous tobacco extract, containing flavor compounds, is separated from the tobacco fiber portion, preferably by centrifugation (14). The tobacco/water slurry may be pumped into a centrifuge from the mixing vessel and centrifugally separated therein. Once removed from the tobacco fiber or lamina portion, the aqueous tobacco extract (15) may be reserved for reapplication to the fiber with or without separate processing. In one embodiment, the aqueous tobacco extract (15) may be contacted with a solid phase adsorbent (17), such as Bentonite or a cationic resin, in a vessel and then separated therefrom by centrifugation (19), or a similar separation process well known in the art. In another embodiment, the aqueous tobacco extract (15) may be pumped or passed through specialty filters, membranes, or column packed adsorbent/absorbent materials to remove soluble nitrogenous components, such as nitrates, proteins and nitrosamines (TSBAs), and polyphenolic compounds, and the like. The nitrogen-reduced aqueous tobacco extract containing flavor compounds may then be concentrated (23) by vacuum evaporation, and added back to a reconstituted tobacco paper (31).

CLAIMS

What is claimed is:

1. A method of making a tobacco material with reduced levels of lignin and nitrogenous compounds comprising :

(a) contacting a tobacco material with a first aqueous solvent to provide an aqueous tobacco extract and a tobacco fiber portion;

(b) separating said aqueous tobacco extract from said tobacco fiber portion;

(c) contacting at a temperature from about 25°C to 120°C said tobacco fiber portion with a solution containing hydrogen peroxide and an alkali metal hydroxide wherein said solution contains said hydrogen peroxide in a concentration of from 2.5% to 12.0% (w/w) and said alkali metal hydroxide is from about 1% to 5% (w/w); and,

(d) separating said solution from said tobacco fiber portion.

2. The method of claim 1, further comprising:

(e) contacting said tobacco fiber portion with a second aqueous solvent.

3. The method of claim 1, wherein said tobacco material is lamina contacted with said first aqueous solvent at a temperature of about 25°C to 80°C for about 0.5 to 2 hours.

4. The method of claim 1, wherein said tobacco material is a fiber portion contacted with said first aqueous solution at 70°C to 120°C for about 0.5 to 4 hours.

5. The method of claim 1, wherein said alkali metal hydroxide is sodium hydroxide.

6. The method of Claim 5, wherein said sodium hydroxide is from about 4% to 8 (w/w).

7. The method of Claim 5, wherein said alkali metal hydroxide is potassium hydroxide.

8. The method of Claim 7, wherein said potassium hydroxide is from about 4% to 8 % (w/w).